

DECISION DOCUMENT

Avant Gardner
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224258
July 2025



**Department of
Environmental
Conservation**

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

Avant Gardner
Brownfield Cleanup Program
Brooklyn, Kings County
Site No. C224258
July 2025

Statement of Purpose and Basis

This document presents the remedy for the Avant Gardner site a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Avant Gardner site and the public's input to the proposed remedy presented by NYSDEC.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent

feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise™ (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Approximately 300 cubic yards of contaminated soil will be removed from the site. Collection and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, and in consultation with NYSDEC, determine if further remedial excavation is necessary.

To ensure proper handling and disposal of excavated material, waste characterization sampling

will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper one foot of exposed surface soil meets the applicable soil cleanup objectives (SCOs) for commercial use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR Part 375-6.7(d).

5. In-Situ Chemical Reduction

Two rounds of In-situ chemical reduction will be implemented to treat contaminants in groundwater. Provect-IR® will be injected into the subsurface via injection wells screened from 15 to 110 feet below grade surface to destroy the contaminants in an approximately 400 square foot area located in the southern portion of the site where chlorinated volatile organic compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

Monitoring for contaminants of concern and geochemical degradation parameters will be required up-gradient, down-gradient, and within the treatment zone. A minimum of two rounds of ground water sampling will be conducted to confirm the effectiveness of the in-situ chemical reduction.

6. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system (SSDS), or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a Track 4 commercial cleanup at a minimum and will include imposition of a site cover, groundwater treatment and monitoring, and installation of an SSDS.

7. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the NYSDEC a

periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);

- allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or New York City Department of Health and Mental Hygiene (NYCDOHMH); and
- require compliance with the NYSDEC approved Site Management Plan.

8. Site Management

A Site Management Plan is required, which includes the following:

- a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

— Institutional Controls: The Environmental Easement discussed in Remedy Element 7 above.

— Engineering Controls: The cover system discussed in Remedy Element 4, the Groundwater Treatment and Monitoring System described in Remedy Element 4, and the vapor mitigation systems discussed in Remedy Element 6.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
 - a provision should redevelopment occur to ensure no soil exceeding protection of groundwater SCOs will remain below storm water retention basin or infiltration structures;
 - descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
 - a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 4 above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs);
 - provisions for the management and inspection of the identified engineering controls;
 - maintaining site access controls and NYSDEC notification; and
 - the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - monitoring of groundwater and indoor air to assess the performance and effectiveness of the remedy; and
 - a schedule of monitoring and frequency of submittals to the NYSDEC.

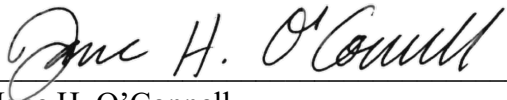
- c) an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation systems. The plan includes, but is not limited to:
- procedures for operating and maintaining the systems; and
 - compliance inspection of the systems to ensure proper O&M as well as providing the data for any necessary reporting.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration NYSDEC guidance, as appropriate. The remedy is protective of public health and the environment.

July 18, 2025

Date



Jane H. O'Connell
Regional Remediation Engineer, Region 2

DECISION DOCUMENT

Avant Gardner
Brooklyn, Kings County
Site No. C224258
July 2025

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

NYSDEC has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

NYSDEC seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by NYSDEC in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

DECInfo Locator - Web Application
<https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C224258>

Brooklyn Public Library - Bushwick Branch
340 Bushwick Avenue
Brooklyn, NY 11206
Phone: 718-602-1348

Brooklyn Community Board 1
435 Graham Avenue
Brooklyn, NY 11211
Phone: 718-389-0009

Receive Site Citizen Participation Information By Email

Please note that NYSDEC's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

SECTION 3: SITE DESCRIPTION AND HISTORY

Location:

The approximately 1.85-acre site is located in the Williamsburg section of Brooklyn, NY and is identified as Block 2977 lots 1, 14, 15 and 16 on the New York City tax map. The site is bounded by Meserole Street to the north, LIRR tracks to the south, Gardner Avenue to the east, and Stewart Avenue to the west.

Site Features:

The site is developed with two one-story buildings, one located on the northeast corner (111 Gardner Avenue) and one on the southwest corner (140 Stewart Avenue) of the property, with asphalt paved areas throughout the remainder of the site. The site is currently an entertainment/music venue. Site occupation is limited to public and staff occupancy during events, staff required for setup, ticket and office areas, operation, and take-down immediately prior to, during and after the scheduled events. Permanent scaffolding structures located in the center of the site consist of a two-story catwalk and a four-story observation tower which are used during entertainment/musical events. No temporary closed tents are used during the colder months.

Current Zoning and Land Use:

The site is currently zoned as M3-1 for industrial and manufacturing use. The site is currently use as an entertainment/musical venue. The surrounding area consists of industrial buildings. Residential buildings are located approximately 1,460 feet southeast of the site. No sensitive receptors were identified within a 500 feet radius of the site.

Past Use of the Site:

Historical site use of the site includes iron and steel works, stainless steel supplier in the southwest portion of the site, and chemical company/liquid bleach manufacturer that operated from at least 1933 to 1992 in a set of connecting building on the southeastern portion of the site. The northeast portion of the site was most recently identified to be used as rubbish removal services with truck maintenance and repair operations.

Site Geology and Hydrogeology:

Soil borings completed at the site identified urban fill materials consisting of bricks, concrete, gravel, metal, and wood from ground surface to about 18 feet below grade surface (bgs), followed by native silty sand, sand and clay to depths of about 35 feet bgs. A noncontinuous peat layer was identified in several of the soil borings at various depths ranging between approximately 13 and 25 feet bgs. Groundwater is present at a depth of approximately 5 to 10 feet bgs and generally flows east to west.

A site location map is attached as Figure 1 and a site layout is attached as Figure 2.

SECTION 4: LAND USE AND PHYSICAL SETTING

NYSDEC may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, an alternative that restricts the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Applicant does not have an obligation to address off-site contamination. However, NYSDEC has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and

- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. NYSDEC has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminants of concern identified at this site are:

tetrachloroethene (PCE)	benzo(a)pyrene
trichloroethene (TCE)	benzo(b)fluoranthene
cis-1,2-dichloroethene	chrysene
benzo(a)anthracene	indeno(1,2,3-cd)pyrene

lead
arsenic
barium
chromium

mercury
perfluorooctanoic acid
perfluorooctane sulfonic acid

The contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

The following IRM has been completed at this site.

Sub-Slab Depressurization Systems (SSDS)

An SSDS was installed in each of the two on-site buildings prior to entering the BCP program. The SSDSs at 140 Stewart Avenue and at 111 Gardner Avenue were installed in 2016 and 2017, respectively, and are currently being operated continuously. Documentation of the installation of the SSDS was provided in the Sub-Slab Depressurization System Operation, Maintenance, and Monitoring Plan submitted prior to the site's enrollment in the BCP. Operation and maintenance of the systems is being conducted under an Interim Site Management Plan.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination:

Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS), and pesticides. Soil vapor, sub-slab soil vapor, and indoor air was analyzed for VOCs. Based upon investigations conducted to date, the primary contaminants of concern include tetrachloroethylene (PCE) and its associated degradation compounds in soil, groundwater and soil vapor.

Soil - VOCs were detected at concentrations above the Protection of Groundwater Soil Cleanup Objectives (PGSCOs) in two hotspots located in the south central and eastern portions of the site

including tetrachloroethylene (PCE) with at a maximum concentration of 2,200 parts per million (ppm) (PGSCO is 1.3 ppm), trichloroethene (TCE) at 140 ppm (PGSCO is 0.47 ppm), and cis-1,2-dichloroethene (cis-DCE) at 21 ppm (PGSCO is 0.25 ppm). Several SVOCs were detected at concentrations exceeding the Commercial Use Soil Cleanup Objectives (CSCOs) throughout the site including benzo(a)anthracene at a maximum concentration of 223 ppm (CSCO is 5.6 ppm), benzo(a)pyrene at 196 ppm (CSCO is 1 ppm), benzo(b)fluoranthene at 217 ppm (CSCO is 5.6 ppm), chrysene at 165 ppm (CSCO is 56 ppm), and ideno(1,2,3-cd)pyrene at 93.6 ppm (CSCO is 5.6 ppm). Metals detected at concentrations exceeding the CSCOs throughout the site include arsenic at a maximum concentration of 263 ppm (CSCO is 16 ppm), barium at 5,570 ppm (CSCO is 400 ppm), chromium at 91.7 (CSCO is 9.3 ppm), mercury at 429 ppm (CSCO is 2.8 ppm) and lead at 5,670 ppm (CSCO is 1000 ppm). For PFAS compounds, perfluorooctanoic acid (PFOA) was detected at a maximum concentration of 1.83 parts per billion (ppb) compared to the protection of groundwater guidance value (PGGV) of 0.8 ppb, and perfluorooctane sulfonic acid (PFOS) at a maximum concentration of 1.53 ppb (PGGV is 1 ppb).

Data does not indicate any off-site impacts in soil related to the site.

Groundwater - Groundwater results were compared against the NYS Ambient Water Quality Standards and Guidance Values (AWQSGVs). Significant chlorinated VOC groundwater impacts were detected at a cluster of samples southwest of the 111 Gardner Ave building, including PCE with maximum concentration of 34,900 ppb (AWQSGV is 5 ppb) and TCE at 3,360 ppb (AWQSGV is 5 ppb). SVOCs including naphthalene at 200 ppb (AWQSGV is 10 ppb), benzo(a)anthracene at 17 ppb (AWQSGV is 0.002 ppb), chrysene at 15 ppb (AWQSGV is 0.002 ppb), and indeno(1,2,3-cd)pyrene at 10 ppb (AWQSGV for each is 0.002 ppb). PFOA was detected at a maximum concentration of 138 parts per trillion, or ppt (AWQSGV is 6.7 ppt) and PFOS at 284 ppt (AWQSGV is 2.7 ppt).

Data does not indicate any off-site impacts in groundwater related to the site.

Soil Vapor, Sub-Slab Vapor, and Indoor Air - Concentrations of VOCs requiring mitigation pursuant to NYSDOH's guidance have been found at the site.

Sub-slab: At the 140 Stewart Avenue building, the maximum detected sub-slab concentrations were: PCE at 54 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), TCE at 4.6 $\mu\text{g}/\text{m}^3$, methylene chloride at 100 $\mu\text{g}/\text{m}^3$. No sub-slab samples were collected from the 111 Gardner Ave building.

Soil Vapor: Elevated levels of VOCs were detected in on site soil vapor samples with a maximum concentration of 4,490 $\mu\text{g}/\text{m}^3$ for PCE and 1440 $\mu\text{g}/\text{m}^3$ for TCE from below the temporary outdoor venue area. At the 111 Gardner Ave building, the maximum detected soil vapor concentrations were: 196 $\mu\text{g}/\text{m}^3$ for PCE and 8.54 $\mu\text{g}/\text{m}^3$ for TCE. No soil vapor samples were collected from the 140 Stewart Ave building.

Indoor Air: At the 140 Stewart Avenue building, elevated levels of VOCs were detected in on site indoor air samples with the maximum concentration of PCE at 2.4 $\mu\text{g}/\text{m}^3$, TCE at 0.17 $\mu\text{g}/\text{m}^3$, and methylene chloride at 4 $\mu\text{g}/\text{m}^3$. At the 111 Gardner Ave building, maximum indoor air concentrations of 2.1 $\mu\text{g}/\text{m}^3$ for PCE and 0.26 $\mu\text{g}/\text{m}^3$ for TCE were detected.

A sub-slab depressurization system (SSDS) was activated at the 140 Stewart Ave building in May 2016. A second SSDS was installed in the 111 Gardner Ave building in June 2017. As an additional measure to reduce potential risk of human exposure to soil vapor, on June 29, 2017, storm drain covers were installed in the temporary outdoor venue area. Indoor air samples from December 2017 from both buildings showed the mitigation measures were successful, and concentrations were below NYSDOH air guidance values.

Data does not indicate any off-site impacts in soil vapor related to the site.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

Contaminated soil remains at the site below asphalt and site buildings; however, people will not come in contact with it unless they dig below the surface materials. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. A sub-slab depressurization system was installed in both on-site buildings to prevent vapors beneath the slab from entering the buildings. The potential exists for people to inhale site contaminants in indoor air due to soil vapor intrusion in any future on-site building development and occupancy. Environmental sampling indicates that vapor intrusion from site contamination is not a concern for other off-site structures.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for soil vapor intrusion into buildings at the site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Commercial use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Excavation, Cover System, Groundwater Treatment, and Vapor Mitigation remedy.

The elements of the selected remedy, as shown in Figures 3, 4 and 5, are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would

- otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise™ (available in the Sustainable Remediation Forum [SURF] library) or similar NYSDEC accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

2. Excavation

Excavation and off-site disposal of contaminant source areas, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soils which exceed the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Approximately 300 cubic yards of contaminated soil will be removed from the site. Collection

and analysis of confirmation samples at the remedial excavation depth will be used to verify that SCOs for the site have been achieved. If confirmation sampling indicates that SCOs were not achieved at the stated remedial depth, the Applicant must notify NYSDEC, submit the sample results and, and in consultation with NYSDEC, determine if further remedial excavation is necessary.

To ensure proper handling and disposal of excavated material, waste characterization sampling will be completed for all identified contaminated site material. Waste characterization sampling will be performed exclusively for the purposes of off-site disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws, rules, and regulations and facility-specific permits.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site.

4. Cover System

A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper one foot of exposed surface soil meets the applicable soil cleanup objectives (SCOs) for commercial use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR Part 375-6.7(d).

5. In-Situ Chemical Reduction

Two rounds of In-situ chemical reduction will be implemented to treat contaminants in groundwater. Provect-IR® will be injected into the subsurface via injection wells screened from 15 to 110 feet below grade surface to destroy the contaminants in an approximately 400 square foot area located in the southern portion of the site where chlorinated volatile organic compounds were elevated in the groundwater. The method and depth of injection will be determined during the remedial design.

Monitoring for contaminants of concern and geochemical degradation parameters will be required up-gradient, down-gradient, and within the treatment zone. A minimum of two rounds of ground water sampling will be conducted to confirm the effectiveness of the in-situ chemical reduction.

6. Vapor Mitigation

Any on-site buildings will be required to have a sub-slab depressurization system (SSDS), or other acceptable measures, to mitigate the migration of vapors into the building from the subsurface.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a Track 4 commercial cleanup at a minimum and will include imposition of a site cover, groundwater

treatment and monitoring, and installation of an SSDS.

7. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or New York City Department of Health and Mental Hygiene (NYCDOHMH); and
- require compliance with the NYSDEC approved Site Management Plan.

8. Site Management

A Site Management Plan is required, which includes the following:

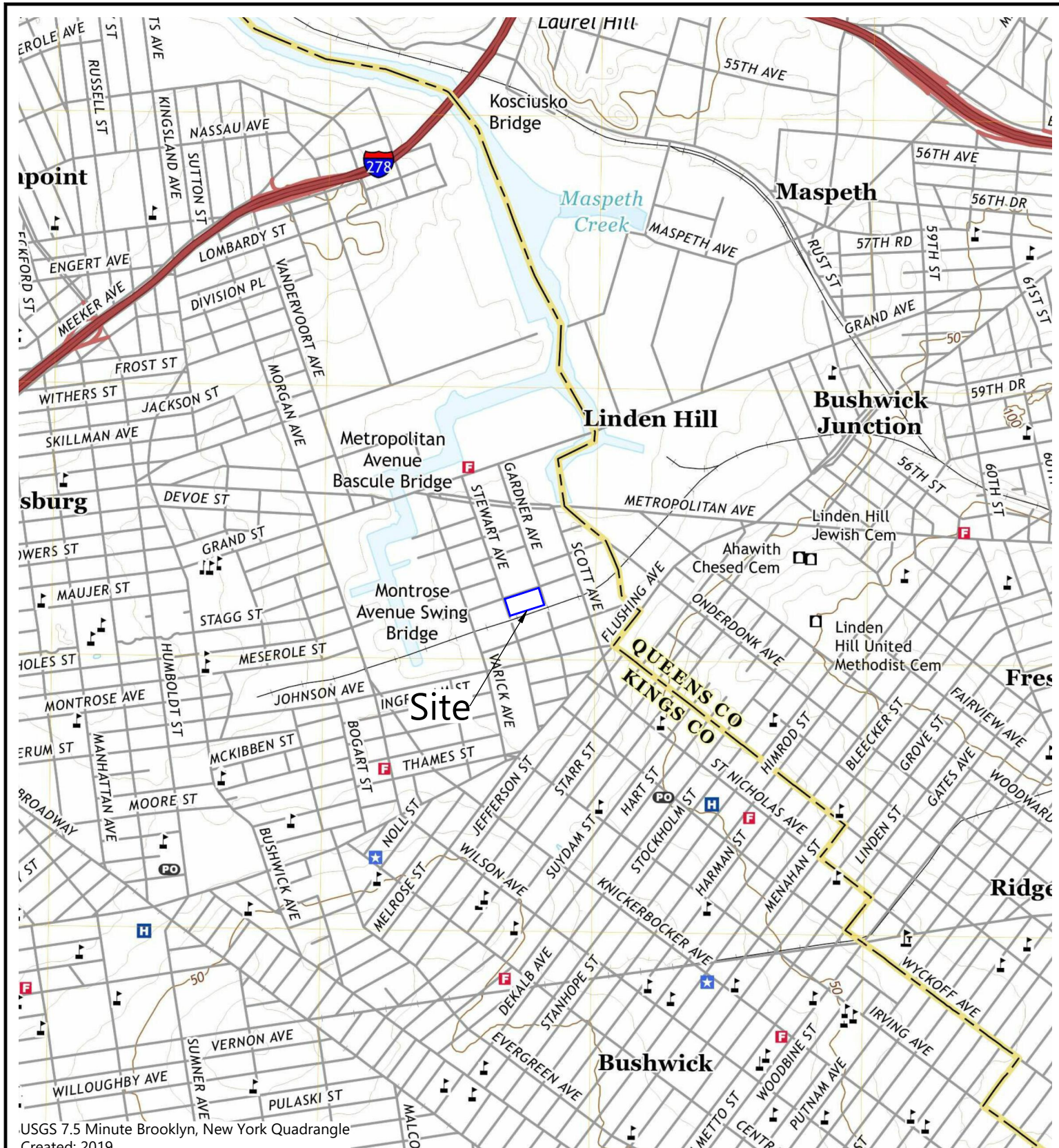
- a) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
 - Institutional Controls: The Environmental Easement discussed in Remedy Element 7 above.
 - Engineering Controls: The cover system discussed in Remedy Element 4, the Groundwater Treatment and Monitoring System described in Remedy Element 4, and the vapor mitigation systems discussed in Remedy Element 6.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision should redevelopment occur to ensure no soil exceeding protection of groundwater SCOs will remain below storm water retention basin or infiltration structures;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 4 above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs);
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and NYSDEC notification; and
- the steps necessary for the periodic reviews and certification of the institutional

and/or engineering controls.

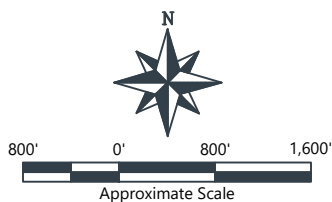
- b) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
 - monitoring of groundwater and indoor air to assess the performance and effectiveness of the remedy; and
 - a schedule of monitoring and frequency of submittals to the NYSDEC.
- c) an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation systems. The plan includes, but is not limited to:
 - procedures for operating and maintaining the systems; and
 - compliance inspection of the systems to ensure proper O&M as well as providing the data for any necessary reporting.



USGS 7.5 Minute Brooklyn, New York Quadrangle
Created: 2019

Legend

Site Boundary



Title:

Site Location Map

Figure:

1

Prepared By:

AS

Date:

February 2022

Project Number:

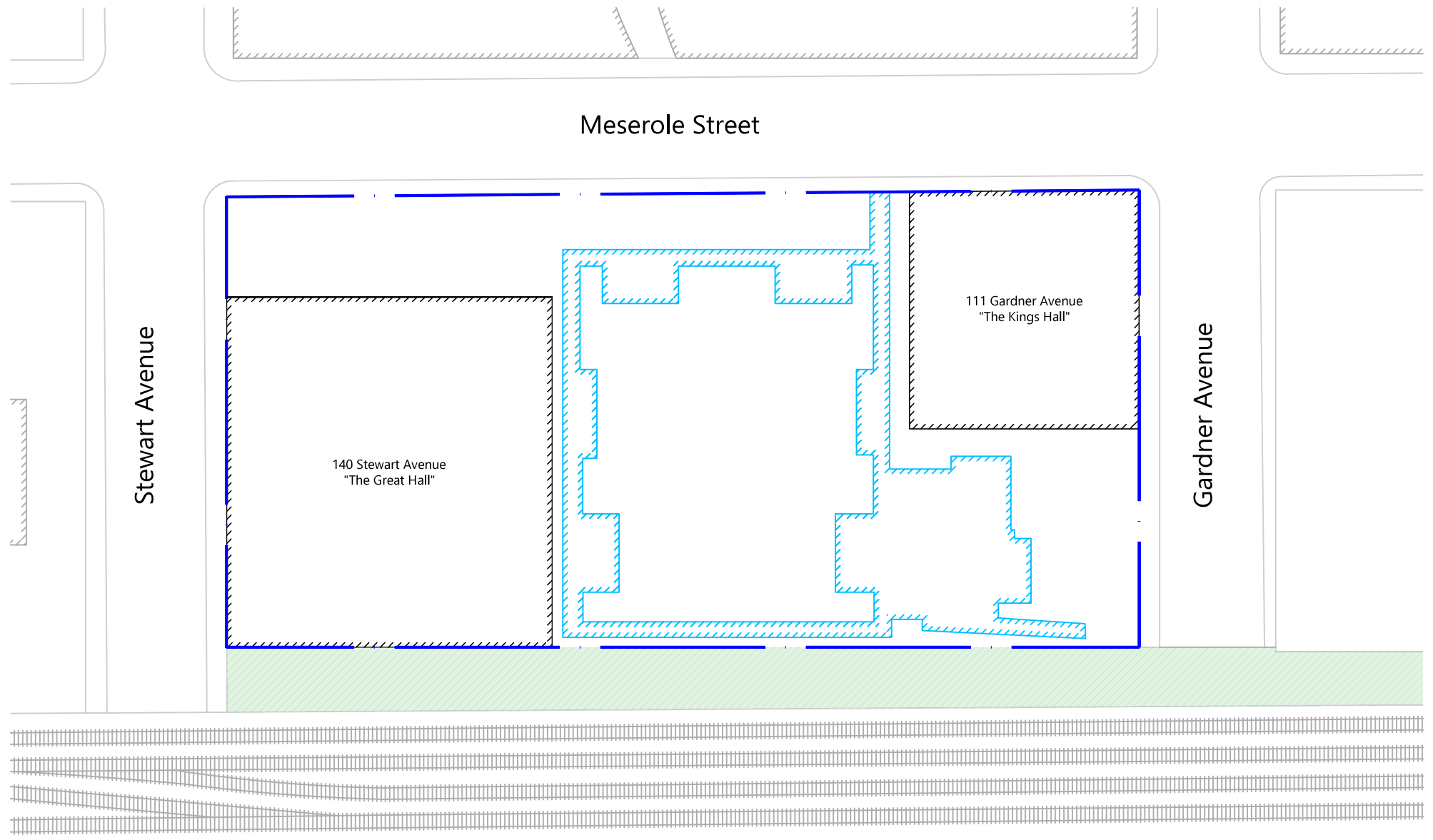
17244793-EN

Address:

140 Stewart Avenue and 111 Gardner Avenue
Brooklyn, New York 11237

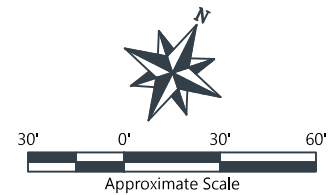
PSG

Engineering and Geology, D.P.C.

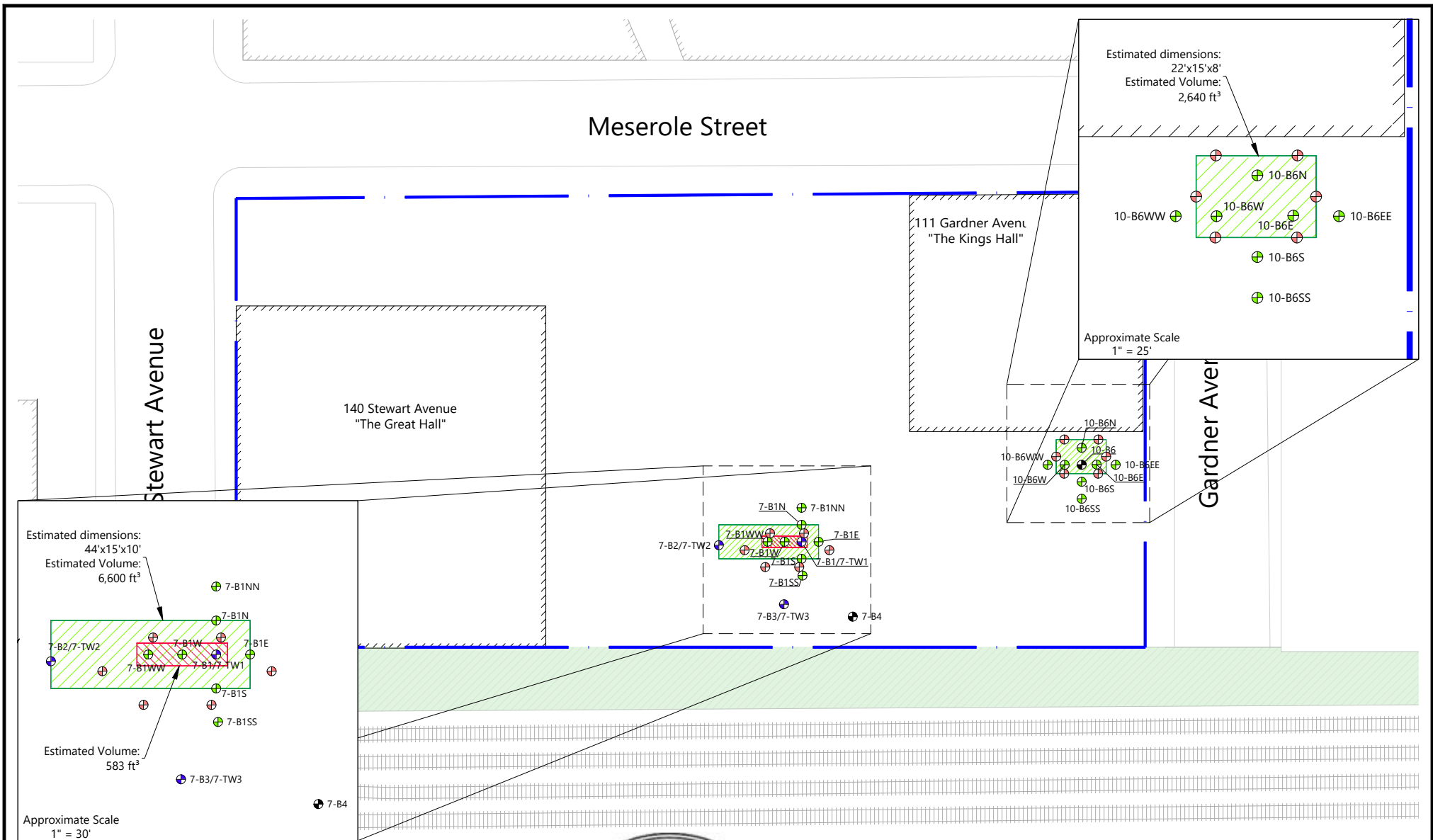


Legend and Notes:

- Site Boundary
- Site Building
- Scaffolding
- BGS = Below Ground Surface

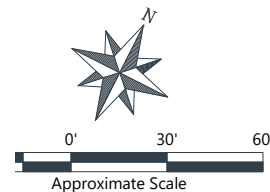


Title: Site Boundary Map			
Figure: 2	Prepared By: AS	Date: February 2022	Project Number: 17244793-EN
Address: 140 Stewart Avenue and 111 Gardner Avenue Brooklyn, New York 11237			
PSG Engineering and Geology, D.P.C.			



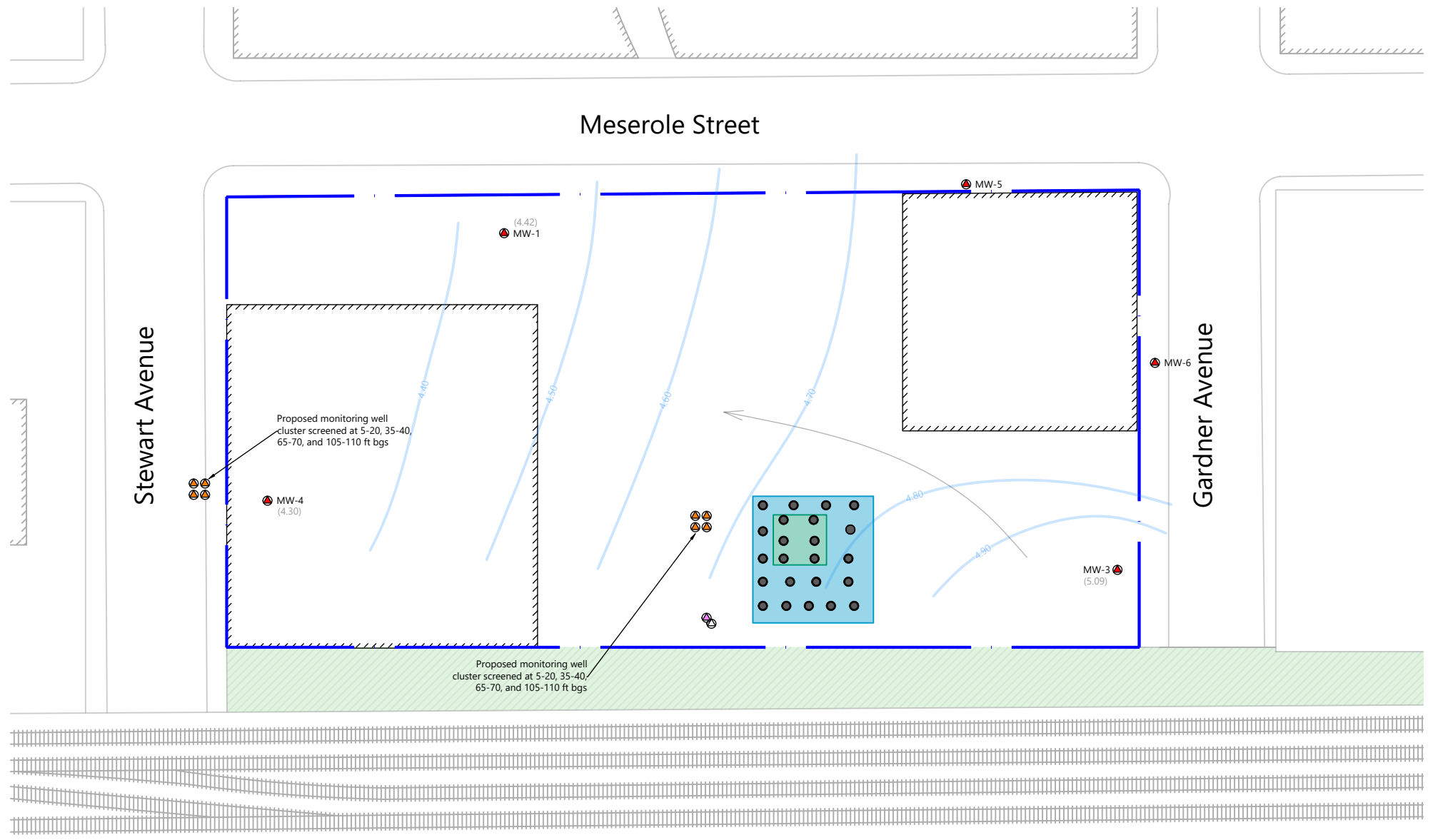
Legend and Notes:

- Site Boundary
- Site Building
- Soil Boring Location (PSG, May 2021)
- Proposed Soil Boring Location (PSG, June 2023)
- Soil Boring/Temporary Well Location (PSG, May 2021)
- End-Point Sample Location
- Approximate Limits of Proposed cVOC Soil Hot Spot Removal
- Approximate Limits of Proposed cVOC Soil Hot Spot Removal - Hazardous Waste



Title: AOCs 7 and 10 Estimated Limits of Proposed cVOC Soil Hot-Spot Removal			
Figure: 3	Prepared By: AS	Date: November 2024	Project Number: ES22-387153
Address: NYSDEC BCP Site #C224258 140 Stewart Avenue and 111 Gardner Avenue Brooklyn, New York 11237			

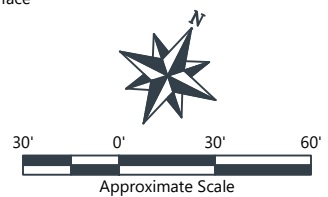
PSG Engineering and Geology, D.P.C.



Legend and Notes:

- Site Boundary (5.09)
- Site Building (4.40)
- Existing Monitoring Well Location (MW-1)
- Proposed Cluster Monitoring Well Location
- Proposed Shallow Monitoring Well Location
- Proposed Deep Monitoring Well Location
- Water Level (FT AMSL)
- Water Level Contour (FT AMSL)
- Horizontal Direction of Groundwater Flow
- Direct Push Injection Point Location
- Preact-IR Target Area (Vertical Interval: 15 to 40 ft bgs)
- Preact-IR Target Area (Vertical Interval: 15 to 110 ft bgs)

- FT AMSL = Feet Above Mean Sea Level
 - Proposed well cluster screened at 5-20, 35-40, 65-70 and 105-11 ft bgs
 - Shallow well screened at 5-20 ft bgs
 - ft bgs = feet below ground surface



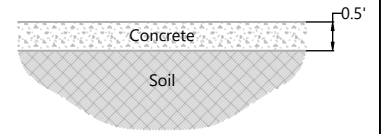
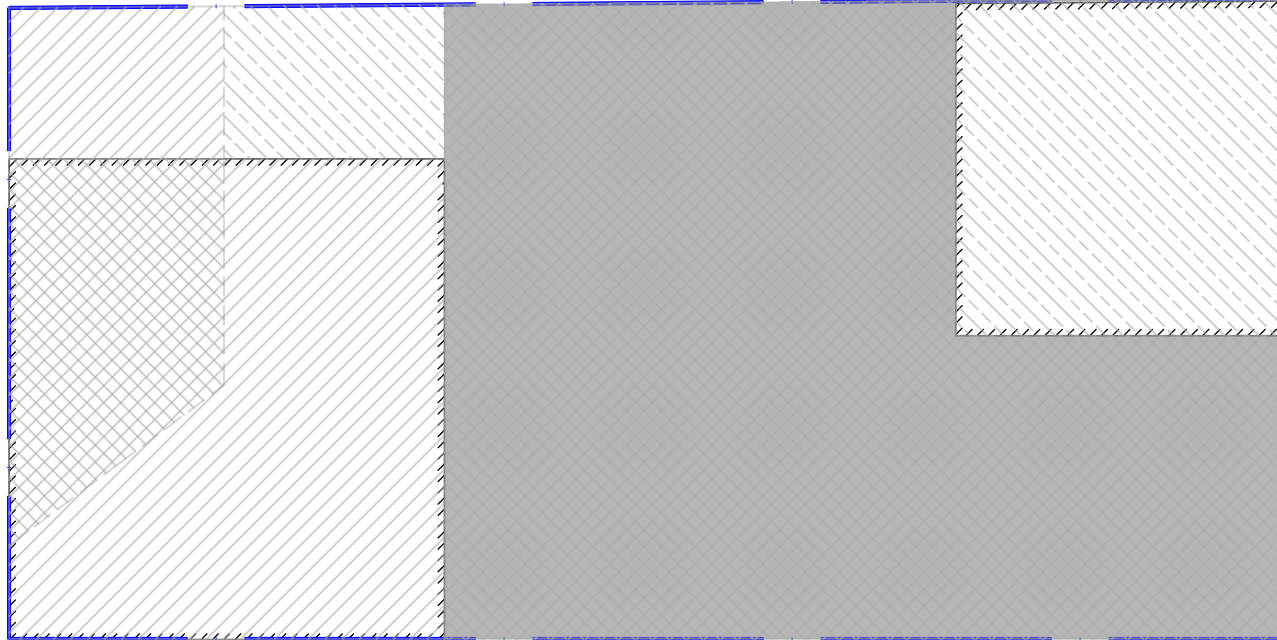
Title: Proposed ISCR Injection Point and Monitoring Well Locations			
Figure: 4	Prepared By: AS	Date: February 2025	Project Number: ES22-387153
Address: NYSDEC BCP Site #C224258 140 Stewart Avenue and 111 Gardner Avenue Brooklyn, New York 11237			

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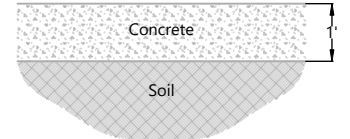
Meserole Street

Stewart Avenue

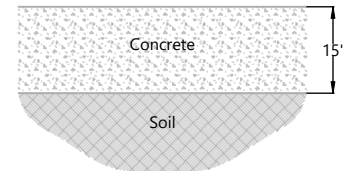
Gardner Avenue



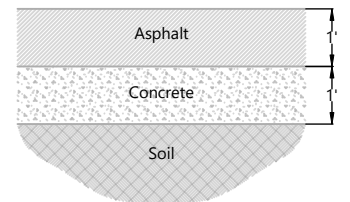
1 0.5' Concrete Cover



2 1' Concrete Cover



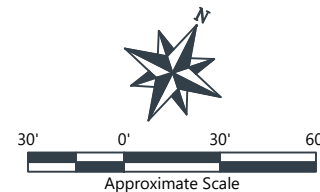
3 1.5' Concrete Cover



4 1' Asphalt and 1' Concrete Cover

Legend and Notes:

- Site Boundary
- 0.5' Concrete Cover (1)
- 1' Concrete Cover (2)
- 1.5' Concrete Cover (3)
- 1' Asphalt and 1' Concrete Cover (4)



Title:			
Cover System Figure			
Figure:	Prepared By:	Date:	Project Number:
5	AS	February 2025	ES22-387153
Address:			
NYSDEC BCP Site #C224258			
140 Stewart Avenue and 111 Gardner Avenue			
Brooklyn, New York 11237			

PSG Engineering and Geology, D.P.C.